

F8500



COMMONWEALTH of VIRGINIA

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY

5636 Southern Boulevard
Virginia Beach, VA 23462
Tel# (757) 518-2000
<http://www.deq.state.va.us>

Dennis H. Treacy
Director

Francis L. Daniel
Tidewater Regional Director

November 1, 2001

Mr. Robert D. Brown
Head, Environmental Management Office
NASA Langley Research Center
Environmental Management Office
Mail Stop: 418
Building 1183, Room 119
15 Hunsaker Loop
Hampton, Virginia 23681-2199

Id. No.: 51-650-00006
Location: Hampton
Registration No.: 60051

Dear Mr. Brown:

Attached is an amended permit to operate an aeronautical research facility in accordance with the provisions of the Commonwealth of Virginia State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. This permit supersedes the permit dated January 3, 2001.

The permit contains legally enforceable conditions. Failure to comply may result in a Notice of Violation and civil penalty. Please read all permit conditions carefully.

In the course of evaluating the application and arriving at a final decision to approve the permit, the Department of Environmental Quality (DEQ) deemed the application complete on October 18, 2001. This permit amendment approval shall not relieve NASA Langley Research Center of the responsibility to comply with all other local, state and federal permit regulations.

ACTION LR 418 418 complete
INFO DEQ (Brown)
LTA 103
DUE DATE — ASSIGNED BY PAP

1200/010027

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The Board's Regulations as contained in Title 9 of the Virginia Administrative Code 5-170-200 provides that you may request a formal hearing from this case decision by filing a petition with the Board within 30 days after this case decision notice was mailed or delivered to you. 9 VAC 5-170-180 provides that you may request direct consideration of the decision by the Board if the Director of the DEQ made the decision. Please consult the relevant regulations for additional requirements for such requests.


As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision (the date you actually received this permit or the date on which it was mailed to you, whichever occurred first), within which to initiate an appeal to court by filing a Notice of Appeal with:

Dennis H. Treacy, Director
Department of Environmental Quality
PO Box 10009
Richmond, Virginia 23240-0009

In the event that this decision is served on you by mail, three days are added to the period in which to file an appeal. Please refer to Rule 2A of the Rules of the Supreme Court of Virginia for information on the required content of the Notice of Appeal and for additional requirements governing appeals from decision of administrative agencies.

If you have any questions concerning this permit, please call Mr. David Mashaw at (757) 518-2168.

Sincerely,


William M. Cash-Robertson
Regional Permit Manager

wmc/dam/nasalrcsop2.doc

Attachments: Permit

cc: Director, OAPP (electronic file submission)
Manager, Data Analysis (electronic file submission)
Chief, Air Enforcement Branch (3AP13), U. S. EPA Region III



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Dennis H. Treacy
Director

Francis L. Daniel
Tidewater Regional Director

COMMONWEALTH OF VIRGINIA OPERATING PERMIT

NEW SOURCE PERFORMANCE STANDARDS PERMIT STATIONARY SOURCE PERMIT TO OPERATE

This permit supersedes the permit dated January 3, 2001.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

NASA Langley Research Center
15 Hunsaker Loop, MS 418
Hampton, Virginia 23681
Registration No.: 60051
Id. No.: 51-650-00006

is authorized to operate

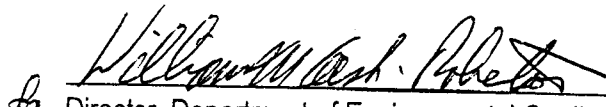
an Aeronautical Research Facility

located at

Route 172, three miles north of I-64, Hampton, Virginia

in accordance with the Conditions of this permit.

Approved on November 1, 2001.


Director, Department of Environmental Quality

Permit consists of 29 pages.
Permit Conditions 1 to 99.

PERMIT CONDITIONS - the regulatory reference and authority for the condition is listed in parentheses () after each condition.

1. Except as specified in this permit, the permitted facility is to be operated as represented in the permit applications dated January 20, 1993, July 27, 1993, June 23, 1994, April 11, 1996, January 31, 1997, May 8, 1998 and January 14, 2000, including amendment sheets dated February 26, 1993, April 22, 1993, October 28, 1993, February 4, 1997, October 15, 1998, December 7, 1998, February 26, 1999, April 22, 1999, March 23, 2000, June 26, 2000, August 16, 2000, October 2, 2000, October 6, 2000, July 23, 2001, August 21, 2001 and October 18, 2001. Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. (9 VAC 5-80-830 of State Regulations)
2. Equipment consists of:
 - (2) Kaiser Marquardt 3" x 8" Sudden Expansion Burners (Unit Ref. No. 1221)
 - (2) Cleaver Brooks Boilers, each rated at 14.645 million BTU/hr (Unit Ref. No. 647)
 - (4) Space Heaters, ranging in size up to 3.348 million BTU/hr (Unit Ref. No. H-O)
 - (23) Space Heaters, ranging in size up to 3.34 million BTU/hr (Unit Ref. No. H-G)
 - CF₄ Tunnel Heater, rated at less than 30 MMBtu/hr (Unit Ref. No. 1275)
 - (3) Babcock & Wilcox Boilers, rated at 168, 168, and 120 million BTU/hr, and (1) English Boiler, rated at 66 million BTU/hr (Unit Ref. No. 1215)
 - (4) Burners at Building 1236, each rated at 50 million BTU/hr (Unit Ref. No. 1236)
 - (12) Emergency Generators and (8) Fire Pumps, ranging in size up to 1000 KW (Unit Ref. No. EG)
 - Scramjet Test Facility (Unit Ref. No. STF)
 - NASA-built 8-foot High Temperature Tunnel (Unit Ref. No. HTT)
 - (15) Degreaser/Parts Washing Units (Unit Ref. No. DG1)
 - (14) Paint Booths (Unit Ref. No. PB)
 - Investment Casting Wax Burn-Out Furnace, Lindberg 11-MT-603636-G20 (Unit Ref. No. Foundry)
 - (2) Underground Storage Tanks, each with a capacity of 8,000 gallons (Unit Ref. No. Tanks)
 - Combustion Heated Scramjet Test Facility (Unit Ref. No. CHSTF)
 - Direct-Connect Supersonic Combustion Test Facility (Unit Ref. No. DCSCTF)
 - (3) Woodworking Shops with fabric filter or cyclone with afterfilter (Unit Ref. No. 1238B, 1283 and 1292)
 - Abrasive Blast Booth with fabric filter (Unit Ref. No. 1237A)
 - Disc Sander with fabric filter (Unit Ref. No. 1238)

- Metal Shop with cyclone (Unit Ref. No. 1225)
- Tysman Cross-Cut Saw, Building 1245 (Unit Ref. No. Saw)
- Acetylene Torch Metal Sheet Cutter, Building 1245 (Unit Ref. No. Torch)

Unit Ref. No. 1221, (2) Kaiser Marquardt 3" x 8" Sudden Expansion Burners

3. The approved fuel for the Sudden Expansion Burners (Unit Ref. No. 1221) liquid propane that meets the specifications for liquid petroleum gas under the American Society for Testing and Materials, ASTM D1835 "Standard Specification for Liquid Petroleum Gas". A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
4. The Sudden Expansion Burners (Unit Ref. No. 1221) shall consume no more than 319,000 gallons of LP gas (propane) per year, calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
5. Emissions from the operation of the Sudden Expansion Burners (Unit Ref. No. 1221) shall not exceed the limits specified below:

| | | |
|-----------------------|-------------|-------------|
| Nitrogen Oxides | | |
| (as NO ₂) | 12.1 lbs/hr | 3.0 tons/yr |
| Carbon Monoxide | 2.0 lbs/hr | 0.5 tons/yr |

(9 VAC 5-80-850 of State Regulations)
6. Visible emissions from each Sudden Expansion Burner (Ref. No. 1221) shall not exceed ten (10) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-170-160 of State Regulations)

7. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the Sudden Expansion Burners (Unit Ref. No. 1221). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. 647, (2) Cleaver Brooks Boilers, each rated at 14.645 million BTU/hr

8. Nitrogen Oxide emissions from each Cleaver Brooks boiler (Unit Ref. No. 647) shall be controlled by flue gas recirculation. The boilers shall be provided with adequate access for inspection.
(9 VAC 5-80-850 and 9 VAC 5-50-260 of State Regulations)
9. The approved fuels for the Cleaver Brooks boilers (Unit Ref. No. 647) are natural gas and distillate oil. Distillate oil is defined as fuel oil that meets the specifications for fuel oil numbers 1 or 2 under the American Society for Testing and Materials, ASTM "Standard Specification for Fuel Oils". A change in the fuels may require a permit to modify and operate.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
10. The Cleaver Brooks boilers (Unit Ref. No. 647) combined shall consume no more than 257 million cubic feet of natural gas and 54,600 gallons of distillate oil per year, each calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 of State Regulations)

11. Emissions from the operation of the Cleaver Brooks boilers (Unit Ref. No. 647) shall not exceed the limits specified below:

| | | |
|--|-------------|--------------|
| Particulate Matter | 0.4 lbs/hr | 1.0 tons/yr |
| PM-10 | 0.2 lbs/hr | 1.0 tons/yr |
| Sulfur Dioxide | 14.9 lbs/hr | 2.0 tons/yr |
| Nitrogen Oxides (as NO ₂) | 4.2 lbs/hr | 4.7 tons/yr |
| Carbon Monoxide | 2.5 lbs/hr | 10.9 tons/yr |
| Volatile Organic Compounds | 0.2 lbs/hr | 0.7 tons/yr |

(9 VAC 5-80-850 of State Regulations)

12. Visible emissions from each Cleaver Brooks boiler (Unit Ref. No. 647) shall not exceed ten (10) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.

(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)

13. The maximum sulfur content of the distillate oil to be burned by the Cleaver Brooks boilers (Unit Ref. No. 647) shall not exceed 0.5 percent by weight per shipment. The permittee shall obtain a certification from the fuel supplier with each shipment of distillate oil. Each fuel supplier certification shall include the following:

- The name of the fuel supplier,
- The date on which the oil was received,
- The volume of distillate oil delivered in the shipment, and
- A statement that the oil complies with the American Society for Testing and Materials specifications for fuel oil numbers 1 and 2.

(9 VAC 5-80-850, 9 VAC 5-80-900 and 9 VAC 5-50-410 of State Regulations)

14. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the Cleaver Brooks boilers (Unit Ref. No. 647). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900, 9 VAC 5-50-20 E and 9 VAC 5-50-260 of State Regulations)
15. Except as specified in this permit, the two Cleaver Brooks boilers (Unit Ref. No. 647) shall be operated in compliance with Federal emissions requirements under 40 CFR 60, Subpart Dc.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)

Unit Ref. No. H-O, (4) Space Heaters

16. The approved fuel for the space heaters (Unit Ref. No. H-O) is distillate oil. Distillate oil is defined as fuel oil that meets the specifications for fuel oil numbers 1 or 2 under the American Society for Testing and Materials, ASTM "Standard Specification for Fuel Oils". A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)
17. The space heaters (Unit Ref. No. H-O) combined shall consume no more than 102,835 gallons of distillate oil per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 of State Regulations)

18. The sulfur content of the oil to be burned in the space heaters (Unit Ref. No. H-O) shall not exceed 0.5 percent by weight per shipment. The permittee shall maintain records (supplier fuel analysis) of all oil shipments purchased. These records shall be available for inspection by the DEQ. Such records shall be current for the most recent five years.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
19. Emissions from the operation of the space heaters (Unit Ref. No. H-O) shall not exceed the limits specified below:
- | | | |
|---------------------------------------|------------|-------------|
| Sulfur Dioxide | 0.8 lbs/hr | 3.7 tons/yr |
| Nitrogen Oxides (as NO ₂) | 0.2 lbs/hr | 1.0 tons/yr |
- (9 VAC 5-80-850 of State Regulations)
20. Visible emissions from the space heaters (Unit Ref. No. H-O) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-170-160 of State Regulations)
21. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the space heaters (Unit Ref. No. H-O). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. H-G, (23) Space Heaters

22. The approved fuel for the space heaters (Unit Ref. No. H-G) is natural gas. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)
23. The space heaters (Unit Ref. No. H-G) combined shall consume no more than 44 million cubic feet of natural gas per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 of State Regulations)
24. Emissions from the operation of the space heaters (Unit Ref. No. H-G) shall not exceed the limits specified below:
- | | | |
|---------------------------------------|------------|-------------|
| Nitrogen Oxides (as NO ₂) | 0.5 lbs/hr | 2.2 tons/yr |
| Carbon Monoxide | 0.4 lbs/hr | 1.9 tons/yr |
- (9 VAC 5-80-850 of State Regulations)
25. Visible emissions from the space heaters (Unit Ref. No. H-G) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-170-160 of State Regulations)

26. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the space heaters (Unit Ref. No. H-G). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. 1275 CF₄ Wind Tunnel Heater

27. The approved fuel for the CF₄ Tunnel Heater (Unit Ref. No. 1275) is natural gas. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)
28. The CF₄ Tunnel Heater (Unit Ref. No. 1275) shall consume no more than 42 million cubic feet of natural gas per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 of State Regulations)
29. Emissions from the operation of the CF₄ Tunnel Heater (Unit Ref. No. 1275) shall not exceed the limits specified below:
- | | | |
|---------------------------------------|------------|-------------|
| Nitrogen Oxides (as NO ₂) | 3.0 lbs/hr | 2.1 tons/yr |
| Carbon Monoxide | 2.5 lbs/hr | 1.8 tons/yr |
- (9 VAC 5-80-850 of State Regulations)

30. Visible emissions from the CF₄ Tunnel Heater (Unit Ref. No. 1275) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-170-160 of State Regulations)
31. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the CF₄ Tunnel Heater. These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. 1215, (3) Babcock & Wilcox Boilers (168, 168 and 120 million BTU/hr) and (1) English Boiler (66 million BTU/hr)

32. Nitrogen Oxide (NO_x) emissions from the 66 million BTU/hr boiler (Unit Ref. No. 1215) shall be controlled by flue gas recirculation and low NO_x burners. The boilers shall be provided with adequate access for inspection.
(9 VAC 5-80-850 and 9 VAC 5-50-260 of State Regulations)
33. The approved fuels for the three (3) Babcock & Wilcox boilers (Unit Ref. No. 1215) are natural gas and distillate oil. The approved fuel for the English Boiler (Unit Ref. No. 1215) is natural gas. Distillate oil is defined as fuel oil that meets the specifications for fuel oil numbers 1 or 2 under the American Society for Testing and Materials, ASTM "Standard Specification for Fuel Oils". A change in the fuels may require a permit to modify and operate.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)

34. The boilers (Unit Ref. No. 1215) combined shall consume no more than 692 million cubic feet of natural gas and 973,000 gallons of distillate oil per year, calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
35. Emissions from the operation of the Babcock & Wilcox boilers (Unit Ref. No. 1215), combined, shall not exceed the limits specified below:
- | | | |
|--|--------------|--------------|
| Particulate Matter | 7.5 lbs/hr | 3.6 tons/yr |
| PM-10 | 4.0 lbs/hr | 3.1 tons/yr |
| Sulfur Dioxide | 264.8 lbs/hr | 34.7 tons/yr |
| Nitrogen Oxides (as NO ₂) | 146.2 lbs/hr | 44.3 tons/yr |
| Carbon Monoxide | 43.9 lbs/hr | 31.5 tons/yr |
| Volatile Organic Compounds | 2.9 lbs/hr | 2.0 tons/yr |
- (9 VAC 5-80-850 of State Regulations)
36. Visible emissions from the 66 million BTU/hr boiler (Unit Ref. No. 1215) shall not exceed ten (10) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)
37. Visible emissions from the 120 million BTU/hr boiler and the two 168 million BTU/hr boilers shall each not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed sixty (60) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-40-20 and 9 VAC 5-40-80 of State Regulations)

38. The maximum sulfur content of the distillate oil to be burned by the three (3) Babcock & Wilcox boilers (Unit Ref. No. 1215) shall not exceed 0.5 percent by weight per shipment. The permittee shall obtain a certification from the fuel supplier with each shipment of distillate oil. Each fuel supplier certification shall include the following:
- a. The name of the fuel supplier,
 - b. The date on which the oil was received,
 - c. The volume of distillate oil delivered in the shipment,
 - d. A statement that the oil complies with the American Society for Testing and Materials specifications for fuel oil numbers 1 and 2.
- (9 VAC 5-80-850, 9 VAC 5-80-900, 9 VAC 5-50-410 and 9 VAC 5-170-160 of State Regulations)
39. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the Babcock & Wilcox boilers (Unit Ref. No. 1215). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
- (9 VAC 5-80-900 of State Regulations)
40. Except as specified in this permit, the 66 million BTU/hr boiler (Unit Ref. No. 1215) shall be operated in compliance with Federal emissions requirements under 40 CFR 60, Subpart Dc.
- (9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)

Unit Ref. No. 1236, (4) Burners at Building 1236, each rated at 50 million BTU/hr

41. The approved fuel for the four burners (Unit Ref. No. 1236) is natural gas. A change in the fuel may require a permit to modify and operate.
- (9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)

42. The four burners (Unit Ref. No. 1236) combined shall consume no more than 40 million cubic feet of natural gas per year, calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
43. Emissions from the operation of the four burners (Unit Ref. No. 1236) shall not exceed the limits specified below:
- | | | |
|--|-------------|-------------|
| Nitrogen Oxides (as NO ₂) | 14.4 lbs/hr | 1.4 tons/yr |
| Carbon Monoxide | 60.0 lbs/hr | 6.0 tons/yr |
- (9 VAC 5-80-850 of State Regulations)
44. Visible emissions from each of the four burners (Unit Ref. No. 1236) shall not exceed ten (10) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)
45. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the four burners (Unit Ref. No. 1236). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 of State Regulations)

Unit Ref. No. EG, (12) Emergency Generators and (8) Fire Pumps

46. The approved fuel for the emergency generators and fire pumps (Unit Ref. No. EG) is diesel fuel. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)
47. The combined annual number of operating hours for the emergency generators and fire pumps (Unit Ref. No. EG) shall not exceed 2,600 hours, calculated monthly as the sum of each consecutive 12-month period. In no event shall the operating hours for any individual unit exceed 500 hours per year, calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 F of State Regulations)
48. The generators and fire pumps (Unit Ref. No. EG) are to be used only for providing power at the location during interruption of service from the normal power supplier and for periodic testing. Failure to comply may result in a Notice of Violation and civil penalty.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
49. Emissions from the operation of the twelve emergency generators and eight fire pumps (Unit Ref. No. EG) shall not exceed the limits specified below:
- | | |
|--|--------------|
| Particulate Matter | 1.0 tons/yr |
| PM-10 | 1.0 tons/yr |
| Sulfur Dioxide | 1.7 tons/yr |
| Nitrogen Oxides (as NO ₂) | 14.4 tons/yr |
| Carbon Monoxide | 3.1 tons/yr |
| Volatile Organic Compounds | 1.0 tons/yr |
- (9 VAC 5-80-850 of State Regulations)

50. Visible emissions from each emergency generator and each fire pump (Unit Ref. No. EG) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)

51. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for each emergency generator and each fire pump (Unit Ref. No. EG). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 of State Regulations)

Unit Ref. No. STF, Scramjet Test Facility

52. The annual number of operating runs for the Scramjet Test Facility (Unit Ref. No. STF) shall not exceed 1040, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
53. Emissions from the operation of the Scramjet Test Facility (Unit Ref. No. STF) shall not exceed the limits specified below:
- | | | |
|---------------------------------------|-------------|-------------|
| Nitrogen Oxides (as NO ₂) | 18.9 lbs/hr | 3.3 tons/yr |
|---------------------------------------|-------------|-------------|
- (9 VAC 5-80-850 of State Regulations)

54. Visible emissions from the Scramjet Test Facility (Unit Ref. No. STF) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)

Unit Ref. No. HTT, NASA-Built 8-Foot High Temperature Tunnel

55. The approved fuel for the High Temperature Tunnel (Unit Ref. No. HTT) is Methane. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)
56. The annual number of operating hours for the High Temperature Tunnel (Unit Ref. No. HTT) shall not exceed 300 hours, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
57. Emissions from the operation of the High Temperature Tunnel (Unit Ref. No. HTT) shall not exceed the limits specified below:
- | | | |
|--|--------------|--------------|
| Nitrogen Oxides (as NO ₂) | 104.0 lbs/hr | 15.6 tons/yr |
| Carbon Monoxide | 25.3 lbs/hr | 3.8 tons/yr |
- (9 VAC 5-80-850 of State Regulations)
58. Visible emissions from the High Temperature Tunnel (Unit Ref. No. HTT) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed sixty (60) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-40-20 and 9 VAC 5-40-80 of State Regulations)

59. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the High Temperature Tunnel (Unit Ref. No. HTT). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-40-20 of State Regulations)

Unit Ref. No. DG1, (15) Degreaser/Parts Washing Units

60. The annual total throughput of solvent in the degreaser/parts washing units (Unit Ref. No. DG1) shall not exceed 530 gallons, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
61. Emissions from the operation of the degreasers/parts washing units (Unit Ref. No. DG1) shall not exceed the limits specified below:
- | | | |
|----------------------------|------------|-------------|
| Volatile Organic Compounds | 0.5 lbs/hr | 2.3 tons/yr |
|----------------------------|------------|-------------|
- (9 VAC 5-80-850 of State Regulations)

Unit Ref. No. PB, (14) Paint Booths (including solvent usage)

62. Particulate emissions from the spray booths shall be controlled by fiberglass, fabric filters, or water curtains. The filters shall be provided with adequate access for inspection and shall be in operation when the spray booths are operating.
(9 VAC 5-80-850 F of State Regulations)
63. The spray booths shall only be used for applying surface coatings to models, research parts, small cockpit components and aircraft wheels.
(9 VAC 5-80-850 F of State Regulations)

64. Each spray booth shall not operate more than 2,080 hours per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
65. Each spray booth (PB-1, PB-2, PB-4 through PB-7, PB-9, PB-10, PB-11, PB-13 and PB14) shall not coat more than 7,600 models and components per year, calculated monthly as the sum of each consecutive 12 month period.
(9 VAC 5-80-850 F of State Regulations)
66. The spray booth (PB-8) shall not coat more than 60 aircraft wheels per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
67. The spray booths (PB-3 and PB-12) combined shall not use more than 0.55 ton of aluminum oxide per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
68. Emissions from the operation of the paint booths (Unit Ref. No. PB) combined, including solvent usage shall not exceed the limits specified below:
- | | | |
|--|-------------|--------------|
| Particulate Matter | 0.5 lbs/hr | 0.8 tons/yr |
| PM-10 | 0.5 lbs/hr | 0.8 tons/yr |
| Volatile Organic Compounds | 18.3 lbs/hr | 19.0 tons/yr |
| Any Individual Hazardous Air Pollutant | | 5.4 tons/yr |
| Total of All Hazardous Air Pollutants | | 15.5 tons/yr |
- (9 VAC 5-80-850 of State Regulations)

69. Visible emissions from the painting booths (Unit Ref. No. PB) shall not exceed five (5) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed ten (10) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-80-850 of State Regulations)
70. Emissions shall be controlled by proper operation and maintenance of air pollution control equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the paint spray booths (Unit Ref. No. PB) and air pollution control equipment. These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. Foundry, Investment Casting Wax Burn-Out Furnace (Lindberg 11-MT-603636-G20)

71. Particulate emissions and opacity from the investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall be controlled by an afterburner, except when the furnace is being used in a non-burnout mode (i.e.- drying oven). The furnace shall be provided with adequate access for inspection.
(9 VAC 5-80-850 and 9 VAC 5-50-260 of State Regulations)
72. The approved fuel for the investment casting wax burn-out furnace (Unit Ref. No. Foundry) is natural gas. The approved fuel for the secondary burner is natural gas. A change in the fuel may require a permit to modify and operate.
(9 VAC 5-80-850 of State Regulations)

73. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall consume no more than 1.28 million cubic feet of natural gas per year, calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 of State Regulations)
74. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall be charged with no more than 5 pounds per hour and 0.3 tons per year of investment wax and resin.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
75. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) primary and secondary chambers shall be equipped with continuous temperature sensors at or near the chamber exits to indicate the temperatures in each chamber.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
76. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) minimum primary and secondary chamber temperatures shall be maintained at 1400° F and 1800° F, respectively, when the unit is in operation, except when feeding a load of waste or wax, or when the furnace is being used in a non-burnout mode (i.e.- drying oven). When feeding a load of wax, minimum primary and secondary chamber temperatures shall be maintained at 1050° F and 1800° F, respectively, when the unit is in operation. Cold start units shall be heated up and maintained at the minimum temperatures listed in this condition until no combustible materials are left on the hearth.
(9 VAC 5-80-850 of State Regulations)
77. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall be equipped with automatic thermostats to maintain the minimum primary and secondary chamber temperatures.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
-

78. The investment casting wax burn-out furnace (Unit Ref. No. Foundry) minimum burn-down cycle time shall be the manufacturer's recommended time of one (1) hour per five (5) pounds of wax loaded into the investment casting wax burn-out furnace. In no event shall this be less than the time required to destroy any visible and odorous emissions.
(9 VAC 5-80-850 and 9 VAC 5-170-160 of State Regulations)
79. Emissions from the operation of the investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall not exceed the limits specified below:
- | | |
|--------------------|--|
| Particulate Matter | 0.1 gr/dscf @ 7% O ₂ |
| Carbon Monoxide | 100 ppmvd 1-hr. avg. @ 7% O ₂ |
- (9 VAC 5-80-850, 9 VAC 5-50-180 and 9 VAC 5-50-260 of State Regulations)
80. Visible emissions from the investment casting wax burn-out furnace (Unit Ref. No. Foundry) shall not exceed five (5) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 5-170-160 of State Regulations)
81. Emissions shall be controlled by proper operation and maintenance of combustion equipment and air pollution control equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the investment casting wax burn-out furnace (Unit Ref. No. Foundry) and air pollution control equipment. These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-50-20 E of State Regulations)

Unit Ref. No. DCSCTF, Direct-Connect Supersonic Combustion Test Facility

82. The number of operating runs for the Direct-Connect Supersonic Combustion Test Facility (Unit Ref. No. DCSCTF) shall not exceed 3,000 runs per year. The annual number of operating runs shall be calculated monthly as the sum of each consecutive 12-month period.
(9 VAC 5-80-850 F of State Regulations)
83. Emissions from the operation of the Direct-Connect Supersonic Combustion Test Facility (Unit Ref. No. DCSCTF) shall not exceed the limits specified below:
- | | | |
|---------------------------------------|------------|-------------|
| Nitrogen Oxides (as NO ₂) | 3.0 lbs/hr | 1.5 tons/yr |
|---------------------------------------|------------|-------------|
- (9 VAC 5-80-850 of State Regulations)
84. Visible emissions from the Direct-Connect Supersonic Combustion Test Facility (Unit Ref. No. DCSCTF) shall not exceed ten (10) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed twenty (20) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20 and 9 VAC 5-50-80 of State Regulations)
85. Emissions shall be controlled by proper operation and maintenance of combustion equipment. The permittee shall develop, maintain, and have available to all operators good written operating procedures and a maintenance schedule for the Direct-Connect Supersonic Combustion Test Facility (Unit Ref. No. DCSCTF). These procedures shall be based on the manufacturer's recommendations, at minimum. A maintenance schedule for all such equipment shall be established and made available to the Tidewater Regional Office for review.
(9 VAC 5-80-900 and 9 VAC 5-40-20 of State Regulations)

Unit Ref. No. Saw, Tysman Cross-Cut Saw, Building 1245

86. Particulate emissions from the Tysman Cross-Cut Saw (Unit Ref. No. Saw) shall be controlled by a cyclone. The cyclone shall be provided with adequate access for inspection and shall be in operation when the Tysman Cross-Cut Saw is operating.
(9 VAC 5-80-850 F of State Regulations)
87. Emissions from the Tysman Cross-Cut Saw (Unit Ref. No. Saw) shall not exceed the limits specified below:
- | | | |
|--------------------|------------|-------------|
| Particulate Matter | 2.2 lbs/hr | 9.7 tons/yr |
|--------------------|------------|-------------|
- (9 VAC 5-80-850 of State Regulations)
88. Visible emissions from the Tysman Cross-Cut Saw (Unit Ref. No. Saw) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.
(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-80-850 of State Regulations)

Unit Ref. No. Torch, Acetylene Torch Metal Sheet Cutter, Building 1245

89. Particulate emissions and Nitrogen Oxide emissions from the Acetylene Torch Metal Sheet Cutter (Unit Ref. No. Torch) shall be controlled by good air pollution control practices. The acetylene torch metal sheet cutter shall be provided with adequate access for inspection.
(9 VAC 5-80-850 F of State Regulations)

90. Emissions from the Acetylene Torch Metal Sheet Cutter (Unit Ref. No. Torch) shall not exceed the limits specified below:

| | | |
|---------------------------------------|------------|--------------|
| Particulate Matter | 3.0 lbs/hr | 13.3 tons/yr |
| PM10 | 3.0 lbs/hr | 13.3 tons/yr |
| Nitrogen Oxides (as NO ₂) | 0.9 lbs/hr | 3.9 tons/yr |

(9 VAC 5-80-850 of State Regulations)

91. Visible emissions from the Acetylene Torch Metal Sheet Cutter (Unit Ref. No. Torch) shall not exceed twenty (20) percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A), except during one six-minute period in any one hour in which visible emissions shall not exceed thirty (30) percent opacity. This condition applies at all times except during start-up, shutdown, or malfunction.

(9 VAC 5-50-20, 9 VAC 5-50-80 and 9 VAC 5-80-850 of State Regulations)

General Facility-Wide Terms and Conditions

92. Emissions from the operation of the aeronautical research facility shall not exceed the limits specified below:

| | |
|---------------------------------------|--------------|
| Particulate Matter | 39.0 tons/yr |
| PM-10 | 28.7 tons/yr |
| Sulfur Dioxide | 42.4 tons/yr |
| Nitrogen Oxides (as NO ₂) | 97.8 tons/yr |
| Carbon Monoxide | 59.7 tons/yr |
| Volatile Organic Compounds | 28.7 tons/yr |

Hazardous Air Pollutants (as VOC or Particulates):

| | |
|--------------------|--------------|
| Any Individual HAP | 5.4 tons/yr |
| Total of All HAPs | 15.5 tons/yr |

(9 VAC 5-80-850 of State Regulations)

93. The permittee shall maintain records of all emission data and operating parameters necessary to demonstrate compliance with this permit. The content of and format of such records shall be arranged with the Tidewater Regional Office. These records shall include, but are not limited to:
- a. The monthly throughput of propane for the Sudden Expansion Burners (Unit Ref. No. 1221);
 - b. The monthly throughput of natural gas and the monthly throughput of distillate oil for the Cleaver Brooks boilers (Unit Ref. No. 647);
 - c. The annual throughput of distillate oil for the space heaters (Unit Ref. No. H-O), calculated monthly as the sum of each consecutive 12-month period;
 - d. The annual throughput of natural gas for the space heaters (Unit Ref. No. H-G), calculated monthly as the sum of each consecutive 12-month period;
 - e. The annual throughput of natural gas for the CF₄ Tunnel Heater (Unit Ref. 1275), calculated monthly as the sum of each consecutive 12-month period;
 - f. The monthly throughput of natural gas and the monthly throughput of distillate oil for the Babcock & Wilcox boilers (Unit Ref. No. 1215);
 - g. All fuel supplier certifications for distillate fuel;
 - h. The annual throughput of natural gas for the burners (Unit Ref. No. 1236), calculated monthly as the sum of each consecutive 12-month period;
 - i. The annual number of operating hours for each emergency generator and each fire pump (Unit Ref. No. EG), each calculated monthly as the sum of each consecutive 12-month period;
 - j. The annual number of operating runs for the Scramjet Test Facility (Unit Ref. No. STF), calculated monthly as the sum of each consecutive 12-month period;
 - k. The annual number of operating hours for the High Temperature Tunnel (Unit Ref. No. HTT), calculated monthly as the sum of each consecutive 12 month period;
 - l. The annual throughput of solvent in the degreaser/parts washing units (Unit Ref. No. DG1), calculated monthly as the sum of each consecutive 12-month period;

- m. The type and amount of products coated in each spray booth (Unit Ref. No. PB), calculated monthly as the sum of each consecutive 12-month period;
- n. The number of operating hours for each spray booth (Unit Ref. No. PB), calculated monthly as the sum of each consecutive 12-month period;
- o. The annual amount of aluminum oxide used in spray booths PB-3 and PB-12, combined, calculated monthly as the sum of each consecutive 12 month period;
- p. The annual throughput of investment wax (Unit Ref. No. Foundry), calculated monthly as the sum of each consecutive 12-month period;
- q. The annual throughput of natural gas for the investment casting wax burn-out furnace (Unit Ref. No. Foundry), calculated monthly as the sum of each consecutive 12-month period;
- r. The quantity of wax (in pounds) and the corresponding burn-down cycle time of each batch loaded into the investment casting wax burn-out furnace (Unit Ref. No. Foundry);
- s. The type of material burned in the investment casting wax burn-out furnace, and the corresponding primary and secondary chamber temperatures for each burn event;
- t. The annual number of operating runs for the Direct-Connect Supersonic Combustion Test Facility, calculated monthly as the sum of each consecutive 12 month period;
- u. The annual emissions of each criteria pollutant for each emissions unit, calculated monthly as the sum of each consecutive 12 month period; and,
- v. The annual emissions of each individual Hazardous Air Pollutant and the total annual emissions for all Hazardous Air Pollutants, each calculated monthly as the sum of each consecutive 12 month period.

These records shall be available on site for inspection by the DEQ and shall be current for the most recent five (5) years.

(9 VAC 5-80-900 and 9 VAC 5-50-50 of State Regulations)

94. This permit may be modified or revoked in whole or in part for cause, including, but not limited to, any of the following actions by the permittee:
- a. Willfully making material misstatements in the permit application or any amendments thereto;
 - b. Failing to comply with the terms or conditions of the permit;
 - c. Failing to comply with any emission standards applicable to an emissions unit included in the permit;
 - d. Causing emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect at the time that an application is submitted; or
 - e. Failing to comply with the applicable provisions of 9 VAC 5-80-10, 9 VAC 5-80-20 and 9 VAC 5-80-30.
- (9 VAC 5-80-1010 of State Regulations)
95. The permittee shall allow authorized local, state and federal representatives, upon the presentation of credentials:
- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
 - b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;

- c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
- d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-80-850 State Regulations)

- 96. If, for any reason, the permitted facility or related air pollution control equipment fails or malfunctions and may cause excess emissions for more than one hour, the owner or operator shall notify the Tidewater Regional Office within four (4) business hours of the occurrence. In addition, the owner shall provide a written statement, within fourteen (14) days, explaining the problem, corrective action taken, and the estimated duration of the breakdown/shut down.

(9 VAC 5-20-180 of State Regulations)

- 97. In the event of any change in control of ownership of the permitted source, the permittee shall notify the succeeding owner of the existence of this permit by letter and send a copy of that letter to the Tidewater Regional Office.

(9 VAC 5-80-940 of State Regulations)

98. Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate your prompt response to requests for information to include, as appropriate: process and production data; changes in control equipment, and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact. The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.1-340 through 2.1-348 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board), and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.
(9 VAC 5-80-900 of State Regulations)
99. A copy of this permit shall be maintained on the premises of the facility to which it applies.
(9 VAC 5-80-860 D of State Regulations)